

Borehole

51-04-10Log Event **A****Borehole Information**

Farm : <u>TX</u>	Tank : <u>TX-104</u>	Site Number : <u>299-W15-156</u>
N-Coord : <u>41,682</u>	W-Coord : <u>76,089</u>	TOC Elevation : <u>670.00</u>
Water Level, ft : <u>96.40</u>	Date Drilled : <u>4/13/1976</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>100</u>	

Borehole Notes:

This borehole was drilled in April 1976 and completed to a depth of 100 ft. The 6-in. casing in the borehole is assumed to be schedule-40 steel tubing with a wall thickness of 0.280 in.

The borehole was collared and drilled to a depth of 20 ft with 8-in. casing, and then drilled to a depth of 105 ft with 6-in. casing. The 6-in. casing was pulled back to 100 ft. The borehole was completed at this depth by filling the bottom 5 ft of the borehole with 15 gal of cement grout. The 8-in. starter casing was removed; 75 gal of grout was injected into the space between this portion of the borehole wall and the permanent 6-in. casing. The drilling log does not mention casing perforations.

The top of the borehole casing is even with the ground surface. The SGLS was able to reach a depth of 96.9 ft.

Equipment Information

Logging System : <u>1</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>04/1996</u>	Calibration Reference : <u>GJPO-HAN-5</u>	Logging Procedure : <u>P-GJPO-1783</u>

Log Run Information

Log Run Number : <u>1</u>	Log Run Date : <u>4/8/1996</u>	Logging Engineer: <u>Mike Widdop</u>
Start Depth, ft.: <u>96.9</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>0.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Borehole

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Analysis Information

Analyst : E.P. BaumgartnerData Processing Reference : P-GJPO-1787Analysis Date : 8/15/1996**Analysis Notes :**

The logging of this borehole with the SGLS was completed in one run. The field verification spectra recorded immediately before and after the survey operation met the acceptance criteria established for the peak shape and system efficiency, confirming the SGLS system was operating within specifications. The energy calibration and peak-shape calibration from these verification spectra were used to establish the channel-to-energy parameters used in processing the spectra acquired during the logging operation.

The segment between depths of 60 and 65 ft was inadvertently skipped by the SGLS log. Since there was no indication of anomalous gamma-ray activity in this interval, the SGLS was not returned to the borehole to acquire data in this interval. The reason for the missing data interval is not known but is being investigated. Casing-correction factors for a 0.280-in.-thick steel casing were applied during analysis.

Cs-137 was the only man-made radionuclide detected in this borehole. The Cs-137 occurs from the surface to 12.5 ft with two distinct peaks at 2.5 and 11 ft. The peak at 2.5 ft has a maximum concentration value slightly greater than 1 pCi/g, and the peak at 11 ft has a maximum value slightly less than 1 pCi/g. Cs-137 was not detected below 12.5 ft in this borehole.

The measured Cs-137 concentrations in the upper portion of the borehole may be understated because the unknown thickness of grout has not been considered in the calculations. The gamma-ray intensity used to measure the K-40 concentration is attenuated by 50 percent or more in the grouted interval (background K-40 concentration is about 6 pCi/g from the surface to a depth of 28 ft compared to the "normal" background of about 12 pCi/g between depths of 28 and 47 ft). The gamma-ray energy used for the Cs-137 measurement will be similarly attenuated. The portion of the K-40 concentration log subject to attenuation indicates that the grouted interval extends to a depth of 28 ft.

The background K-40 concentration increases abruptly at 48 ft from about 12 pCi/g to about 19 pCi/g.

Details regarding the interpretation of the data for this borehole are presented in the Tank Summary Data Report for tank TX-104.

Log Plot Notes:

Separate log plots show the man-made (e.g., Cs-137) and the naturally occurring radionuclides (e.g., K-40, U-238, and Th-232). The natural radionuclides can be used for lithologic interpretations. The headings of these plots identify the energy peak for the specific gamma rays used to calculate the concentrations. Uncertainty bars on the plots show the statistical uncertainty for the calculated concentrations at the 95-percent confidence level. The MDL is shown by open circles on the plots. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made radionuclides, the naturally occurring radionuclides, the total gamma count derived from the SGLS and a Tank Farm gross gamma log. The gross gamma plot displays the latest available digital data from the database. Adjustment of the depths to coincide with the SGLS data was not attempted.